

# PROCEEDINGS OF THE TENNESSEE ACADEMY OF SCIENCE FOR 1949

W. ROGER RUSK, SECRETARY  
*The University of Tennessee, Knoxville*

## MEETINGS OF THE EXECUTIVE COMMITTEE SUMMER MEETING

A meeting of the Executive Committee of the Tennessee Academy of Science was held in the Home Economics Building, George Peabody College for Teachers, Nashville, Tennessee, on August 6, 1949, with the following members present: Frances R. Bottum, George Peabody College for Teachers; C. L. Baker, Southwestern College; Warren McA. Deacon, Vanderbilt University; James J. Friauf, Vanderbilt University; S. L. Meyer, University of Tennessee; W. Roger Rusk, University of Tennessee; Carl K. Seyfert, Vanderbilt University; Jesse M. Shaver, George Peabody College for Teachers.

The reading of the minutes of the last meeting was waived.

*Appointment of Committees.* The Executive Committee unanimously confirmed the appointment of the following committees:

*The Executive Committee:* Warren McA. Deacon as member at large for a three-year term beginning in the fall of 1949.

*The Science Talent Search Committee:* C. A. Buehler, Howard Kirksey, James Major (*Chairman*), C. S. Shoup, H. A. Webb. The sixth member of this committee is to be chosen by Mr. Major.

*The Membership Drive Committee:* Dr. Bottum read a letter from James H. Elder, Chairman of the Membership Drive Committee, indicating that he wished to resign. The Executive Committee agreed to ask C. T. Bahner to serve as the new chairman and Miss Eleanor McGilliard to serve as a new member of the Committee. The membership of the Committee is now as follows: H. W. Anderson, Charles T. Bahner (*Chairman*), C. S. Erickson, Eleanor McGilliard, W. Roger Rusk (*Ex Officio*), Jesse M. Shaver, (*Ex Officio*).

*Official Representative to A.A.A.S. meetings in New York, 1949:* Clinton L. Baker.

### *Reports of Committees:*

Dr. C. L. Baker, Director of the Reelfoot Lake Biological Station, reported that his committee consists of the following members: James J. Friauf, S. L. Meyer, C. S. Shoup. Dr. Baker stated that his annual report is to be published in the Journal.

Dr. Jesse M. Shaver made a report as Editor of the JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE. This mainly consisted of an estimate of the cost of publishing the JOURNAL and the means by which the money is secured. The cost of reprints was discussed, and Dr. Shaver was instructed to continue the present system of charging for reprints. The Committee agreed to accept Dr. Shaver's report.

*Unfinished Business:* There was no unfinished business to be considered at that time.

*New Business:*

1. The Committee considered applications for grants-in-aid of research from the A.A.A.S. Research Fund as follows:

A. J. Sharp, University of Tennessee, \$150.00, for transportation cost for study at Harvard on vascular flora of Tennessee.

Ellis S. Rucker, Middle Tennessee State College, \$52.46, for a study of the digger wasp.

An application signed by C. G. Ransom, no specific amount, for research on the production of Rh hapten.

Jesse M. Shaver, George Peabody College for Teachers, \$100.00, for transportation expenses in looking for the rare *Woodsia scopulina*.

Robert R. Bryden, Middle Tennessee State College, \$57.50, for study of Hydra in Kirkpatrick Lake.

A. C. Cole, University of Tennessee, \$100.00, for study of ant larvae.

A motion was made and passed that the petition for funds to aid in production of Rh hapten be eliminated from consideration. A motion was made and passed to eliminate the petitions of either Rucker or Bryden. It was unanimously agreed to retain Bryden's petition for further consideration. The committee agreed to cut the amounts to be awarded from the amounts requested to the following: Sharp, \$100.00; Shaver, \$75.00; Cole, \$75.00; Bryden, \$50.00. The committee agreed to use the 1947 and 1948 A.A.A.S. funds (\$27.00 and \$90.50) to make these awards and to reserve the 1949 fund (\$112.00) for any applications which may come up for consideration before October 1, 1949. The balance to be awarded was to be made up from the regular Academy funds.

2. A committee made up of W. McA. Deacon, Chairman, and James J. Friauf was appointed to look into the matter of a possible change in the Constitution to provide for the position of Historian to go over the records of the Academy, and to see Dr. Kuhlman of the Joint University Library about the possibility of storing the records in the library building.

3. Amendments to the Constitution. The Committee considered certain further revisions in the Constitution, the need for such revisions having become evident following the more extensive revisions enacted by the Academy at the general meeting in November, 1948. The committee recommended that the proposed new amendments be presented to the Academy membership for ratification at the annual meeting in December.

4. Time and Place of the Annual Meeting of the Academy. It was decided that the annual meeting of the Academy would be held at Memphis, Tennessee, on December 2 and 3, 1949, at Southwestern College.

## FALL MEETINGS

The Executive Committee met for a brief time on Friday afternoon, December 2, just prior to the Business Meeting of the Academy. The following items of business were enacted: (1). Denied an application for an A.A.A.S. research grant from A. M. Winchester, Stetson University, Florida, and from Joseph Y. Peary, Alderson Broaddus College, West Virginia. (2). Voted to hold over until next year the 1949 A.A.A.S. award. (3). Considered personnel for the various committees which were to be announced at the ensuing business meeting of the Academy. (4). Voted to recommend to new Executive Committee that appropriate constitutional changes be undertaken to provide for the office of historian of the Academy. (5). Adjourned to continue the meeting Friday evening.

The Executive Committee reconvened Friday evening, December 2, at the home of Dr. C. L. Baker. Attending were C. L. Baker, Frances R. Bottum, W. M. Deacon, J. J. Friauf, S. L. Meyer, W. R. Rusk, C. K. Seyfert, J. M. Shaver, and A. I. Smith. After a discussion of the practice of charging a fee for copies of the roll of membership of the Academy, it was voted to make a charge of \$10.00 hereafter for copies to be used for advertising purposes. Upon a motion by Dr. Meyer, the committee instructed the Secretary to complete his tour of duty by filing an annual report for publication in the *JOURNAL* and sending a notice of the meetings to *Science*. Upon a motion by Dr. Baker, it was voted to require of each recipient of a Tennessee Academy of Science Research grant both a progress report and a final report. Invitations to the Academy for the 1950 meetings were considered. After some discussion of the problem of geographical representation within the state, it was decided unanimously to accept the invitation of East Tennessee State College to hold the next annual meeting in Johnson City.

The Committee discussed, but took no action on, a request from "CARE" for donations of books and periodicals for scholars abroad. The suggestion was made that solicitation be made through the medium of a news letter. The Committee decided that new members should have an option concerning the effective beginning date of their membership. Where no option is expressed, the date of July is to determine which year is to be the first year of membership, those joining the Academy before July 1 have their memberships for the current, those after July 1 for the following year. It was decided to have printed and use effectively new application forms and membership cards. The problem of removing delinquent members from the roll was discussed at some length. The Treasurer was instructed to drop from the roll delinquent members after a diligent effort to collect back dues in pursuance of the regulations of the Academy. The Treasurer was commended for his recent work on this problem. The Committee decided to accept the \$2.00 membership fee from current applicants, and instructed the Treasurer to accept only \$3.00 dues after January 1, 1950. The Committee decided that accumulation of annual membership dues shall not apply henceforth to the life membership fee of \$50.00, life memberships are to be considered upon the basis of a \$50.00 lump sum payment. An investment committee consisting of Professor Deacon, Chairman, and Dr. Friauf, was appointed to invest the amounts of money now in the Endowment Fund and in the Life Membership Fund, the total being \$634.50.

## THE FIFTY-NINTH ACADEMY MEETING

### GENERAL REMARKS

The fifty-ninth meeting of the Academy was held Friday and Saturday, December 2-3, 1949, at Southwestern College in Memphis. Following registration on Friday morning, the Academy met in General Session for a program of films and papers of wide interest.

This program continued during the afternoon until 4:00 P. M. at which time the annual business meeting was conducted. A pleasant and well-attended Academy Dinner on Friday evening was the climax of the activities on Friday. Conjointly with the Academy meetings, the Tennessee Junior Academy of Science met for its Eighth Annual Meeting on Saturday morning.

Sectional meetings met on Saturday morning, with the following Section chairmen presiding: *Botany Section*—Miss Eleanor McGilliard, University of Chattanooga; *Chemistry Section*—Dr. George K. Schweitzer, University of Tennessee; *Mathematics Section*—Dr. M. L. MacQueen, Southwestern College; *Psychology Section*—Dr. Stanford C. Ericksen, Vanderbilt University; *Zoology Section*—Dr. J. Gordon Carlson, University of Tennessee; *Tennessee Junior Academy*—Robert W. McGowan, Shelby Forest State Park.

## GENERAL SESSIONS

### Friday Morning

CONSERVATION OF SOUTHERN HARDWOOD FORESTS (movie). Russell Stadelman, *Nickey Brothers, Inc.*, Memphis.

INCREASING PRODUCTIVITY OF LAKES AND PONDS THROUGH PROPER MANAGEMENT. Glenn Gentry, *State Department of Conservation*, Nashville.

ECONOMICS OF HYDROELECTRIC POWER. Ray Kinslow, *Tennessee Polytechnic Institute*, Cookeville. Published in the April no. of the JOURNAL.

STUDIES ON THE UPTAKE OF RADIOACTIVE THIOCYANATE BY THE THYROID OF THE RAT. J. L. Wood and Nelson Kingland, *University of Tennessee*, Memphis.

AUREOMYCIN IN THE TREATMENT OF AMOEBIASIS. D. H. Sprunt, R. L. Laird, and L. McVey, *University of Tennessee*, Memphis.

DEVELOPMENT OF SPOROZOITES TO CRYPTOZOITES IN TISSUE CULTURES. R. L. Laird, I. N. Dubin, and V. P. Drinnon, *University of Tennessee*, Memphis.

### Friday Afternoon

POPULATION TRENDS AND NATURAL RESOURCES. C. L. Baker, *Southwestern College*, Memphis.

FLORA IN KODACHROME. Brother Ignatius Vincent, *Christian Brothers College*, Memphis.

THE CHEMIST AND THE COTTONSEED INDUSTRY. T. L. Rettger, *Buckeye Cotton Oil Company*, Memphis.

VALLEY OF THE GIANTS (movie). U. S. Engineers, Memphis.

## BOTANY SECTION

TENNESSEE BOTANICAL SURVEY, SPRING AND FALL 1949. Royal E. Shanks, *University of Tennessee*. A general summary of the last two quarters of intensive field work on the Tennessee flora project. Spring and fall flora were sampled during visits to most of the Tennessee counties, and 5000 collection numbers were added to the University Herbarium. The intensive collecting phase of the project is now considered to be complete, and further work on the collections is in progress. Notable contributions to our knowledge of the Tennessee flora have resulted from Dr. A. J. Sharp's visit to the major herbaria in the northeast with the support of a grant from the Tennessee Academy of Science.

A SURVEY OF COASTAL PLAIN PLANTS OCCURRING IN TENNESSEE. Samuel L. Fairchild, *University of Tennessee*. A discussion of Coastal Plain plants occurring in Tennessee compiled from published reports and specimens on file

in the Herbarium at the University of Tennessee. There is an attempt to correlate the distribution of this element with types of habitat and to show a relationship with the habitats of the Coastal Plain region.

DIATOMS OF REELFOOT LAKE, TENNESSEE. Arlo I. Smith, *Southwestern*. This is a preliminary report on the diatom distribution over a period of one year as found in collections taken at intervals of four to six weeks. Samples were taken to include bottom, epiphytic, and planktonic forms. Bottom forms of diatoms include various species of *Navicula*, *Nitzschia*, *Surirella*, and *Pleurosigma*. Epiphytic forms most common were found to be species of *Cocconeis*, *Achnanthes*, *Cymbella*, and *Gomphonema*. Planktonic forms most common were *Eunotia*, *Melosira*, *Cyclotella*, *Synedra*, *Epithemia*, and *Navicula*. The size and shallowness of the lake, with wind conditions, cause such water movements that the diatom flora resembles river and stream types due to oxygenation.

PHYSIOLOGICAL STUDIES ON MOSSES. VIII. OBSERVATIONS ON THE REGENERATION OF STATE OF PHYSCOMITRIUM TURBINATUM. Paul L. Redfearn, Jr., and Samuel L. Meyer, *University of Tennessee*. Experiments with excised setae of *Physcomitrium turbinatum* indicated a marked difference in the potentialities for regeneration when in whole segments and cut into segments of various sizes. Whole setae and the top-half of setae cut into half segments showed the highest percentages of regeneration. The lowest percentages of regeneration occurred in the basal segments of setae cut into quarter segments. Protonemata developed from the cut ends of the setae either from internal or epidermal tissue and at both the apical and basal ends. Light was essential for the production of protonemata. Gametophytes were produced by regeneration of setae.

PRELIMINARY NOTES ON SOME ASCOMYCETES FROM MIDDLE TENNESSEE. Frederick T. Wolf, *Vanderbilt University*. Very little is known concerning the Ascomycetes of Tennessee. Hesler, in his numerous papers, records a considerable number of species from Eastern Tennessee, and Meyer has studied the coprophilous forms. Collections made in the vicinity of Nashville during the last three years now include 25 species which can be identified with some degree of certainty. The number of these belonging to various orders is as follows: Taphrinales, 1; Erysiphales, 6; Hypocreales, 1; Sphaeriales, 8; Dothideales, 2; Hemisphaeriales, 1; Helotiales, 2; and Pezizales, 4.

A NEW STATION FOR WOODSIA SCOPULINA IN TENNESSEE. Jesse M. Shaver, *George Peabody College for Teachers*. A new station for this rare Tennessee fern is here reported.

TWO NEW STATIONS FOR SCOTT'S SPLEENWORT IN TENNESSEE. Jesse M. Shaver, *George Peabody College for Teachers*. Reports this relatively rare fern from two additional counties in the state. Previously this fern has been known from three Tennessee stations only.

FURTHER DISTRIBUTION NOTES ON THE WOODY PLANTS OF TENNESSEE. Frank W. Woods and Royal E. Shanks, *University of Tennessee*. Distribution patterns of Tennessee woody plants are discussed, with special emphasis on those species which are poorly represented in present collections. Of approximately 500 species of woody plants known from Tennessee, about one-tenth are believed to occur in every county and about one-twentieth are now known from a single county.

FACTS AND FIGURES ON BIG TREES OF TENNESSEE. Everett H. Cooley, *University of Tennessee*. Accumulated records at the University of Tennessee, Great Smoky Mountains National Park, and in the files of the American Forestry Association are presented, with a request for additional records from other sources. Twenty-three species are believed to attain their maximum recorded size in Tennessee.

SOME TAXONOMIC PROBLEMS OF CHLOROCOCCUM-LIKE ALGAE. Richard C. Starr, *Vanderbilt University*. The taxonomy of *Chlorococcum*-like algae is

very confusing due to the multitudinous descriptions of these algae in the literature. For the most part these descriptions are based on a relatively few specimens collected in the field and immediately described. In this paper are discussed various problems encountered by the author who is engaged in the study of approximately 75 isolations of *Chlorococcum*-like algae. An effort is made to show that without studies of such algae in culture, taxonomy of this group is impossible. The need for physiologic criteria in distinguishing species is also mentioned as a possibility.

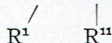
### CHEMISTRY SECTION

THE EFFECTS OF AROMATIC HYDROCARBONS ON THE SULFUR METABOLISM OF THE RAT. Helmut R. Gutmann and John L. Wood, *University of Tennessee School of Biological Sciences*. The effects of aromatic hydrocarbons on sulfur metabolim have been investigated using radio methionine. After a single injection of methionine one-fifth of the administered sulfur was excreted in the urine in forty-eight hours. Bromobenzene or anthracene caused excretion of small amounts of mercapturic acids while 3,4-benzopyrene had no such effect. In other experiments rats were placed on a diet supplemented by radio methionine until the specific radioactivity of the urinary sulfur had become constant. The distribution of the sulfur was measured following the administration of the hydrocarbons. The effects of bromobenzene or anthracene differed from those produced by 3,4-benzopyrene or phenanthrene. The implications of these findings was discussed.

SPECTROSCOPIC ANALYSIS OF ISOMETRIC MIXTURES. Raymond T. Vaughn, *Southwestern at Memphis*.

MICROBIAL RESPONSE TO AMINDO ACID DERIVATIVES. Charles H. Eades, Jr., *University of Tennessee School of Biological Sciences*. The growth-promoting effects of the acetyl, chloroacetyl and acetyl dehydro derivatives and the keto analogs of valine, leucine, tryptophan and phenylalanine on *Lactobacillus arabinosus*, *Lactobacillus casei* and *Leuconostoc mesenteroides* were investigated. Among the results, the keto analogs of valine and leucine wese found to support the growth of *L. casei* and *L. arabinosus* but were not effective for *L. mesenteroides*. The relationship of such growth responses are discussed with regard to possible intermediary metabolic pathways and their effects on microbiological assay results.

THE SYNTHESIS AND PROPERTIES OF SEVERAL ALPHA, BETA-UNSATURATED ETHERS. Carl M. Hill and Robert A. Walker, *Tennessee A. and I. State College*. In the course of an investigation underway in this Laboratory, it became necessary to synthesize several new alpha, beta-unsaturated ethers of the type



$\text{C}_6\text{H}_{11}$  — ;  $\text{R}^1$ , H, and  $\text{CH}_3$ ;  $\text{R}^2$ , phenyl, p-methylphenyl, m-methylphenyl, and p-methoxyphenyl. These ethers were prepared in good yield by modification of a synthesis reported by Lauer and Spielman\* (*J. Am. Chem. Soc.*, 53, 1533 (1931)). Measurement of density, refractive index and molar refractivity, and determination of composition by analysis were observed for both the halogenated ethers and their alpha, beta-unsaturated derivatives. The chemical behavior of the alpha, beta-unsaturated ethers toward several chemical reagents was investigated.

A STUDY OF STERIC INHIBITION IN THE PFITZINGER REACTION. George P. Mueller and Robert E. Stobaugh, *University of Tennessee*. A survey of the Pfitzinger reaction reveals that little attention has been given to the steric factors likely to govern the course of the reaction; much of the research carried out in this field has dealt with its value in the synthesis of certain anti-malarials. The purpose of the work presented was to add further information concerning steric effects in the Pfitzinger condensation. The reaction is that

between isatin and a molecule bearing a methylene group adjacent to a carbonyl function, in strongly alkaline solution. The product of this reaction is a salt of a quinoline-4-carboxylic acid. It is reasonable that the substituents attached to the reactive ketonic groups may exert a steric influence upon the condensation, in some cases hindering or completely preventing it. This work involved reactions concerning ketones with more or less bulky substituents on the methylene carbon atom. The results obtained indicate that neither the *n*-butyl nor the *p*-tolyl group in such a position exerts a large amount of hindrance in the reaction. However, one ortho methyl group hinders the condensation greatly and two such groups prevent it entirely.

**THE METABOLISM OF ACETYLDEHYDROAMINO ACIDS.** Shirley Lucille Cooley and John L. Wood, *University of Tennessee School of Biological Sciences*. Acetyldehydrotryptophan and acetyldehydrovaline have been prepared by treatment of the corresponding chloroacetyl amino acids with acetic anhydride followed by hydrolysis. The products were characterized by reduction to the known acetyl amino acids and by hydrolysis to the corresponding known keto acids. The compounds have the components of an amino acid but lack a center of asymmetry since the acetyldehydroamino acid lacks two hydrogen atoms. When added to diets deficient in the corresponding essential amino acids, the compounds were ineffective in supporting the growth of young rats. Supplementation of the same diets with the amino acid, the chloroacetyl derivative, acetyl derivative, or the keto acid resulted in good growth.

**SELF-ABSORPTION CORRECTIONS WITH LOW ENERGY BETA EMITTERS.** George K. Schweitzer, *University of Tennessee*. Radioactive sulfur-35, emitting beta particles of low energy (170 KEV), has been used to prepare various insoluble sulfates. These precipitates have been used to investigate the effect of self-absorption on the activities of samples with a constant area and varying thicknesses. Two methods are proposed for correcting counting data to true activity, that is, activity with no self-absorption.

#### MATHEMATICS SECTION

**NOTES ON PRIMITIVE ROOTS OF  $P^n$ .** H. L. Lee, *University of Tennessee* (Presented by Joe Parsons). The paper is concerned with finding the primitive roots of the *n*-th power of *p*, where *p* is a prime. This is easy if *n* is one, but if *n* is greater than one, there is one quite tedious point that seems to be very hazily explained in most texts on number theory.

**EULER'S ALGEBRA.** John F. Williams, *Memphis State College*. A presentation of characteristic ideas of Euler plus a brief review of his book on algebra. Examples from his book were used as illustrations.

**A COMPARATIVE STUDY OF CRITICAL THINKING IN FRESHMAN MATHEMATICS.** J. Houston Banks, *George Peabody College for Teachers*. This paper presents the results of an experiment to determine the relative effectiveness of college algebra and general mathematics, insofar as each contributes to the improvement in ability to do critical thinking with non-mathematical material. The evidence points to the superiority of general mathematics.

**NOTES ON SOME MATHEMATICAL TERMS.** Wilson L. Miser, *Vanderbilt University*. The meanings of such terms as power, quadratic, and directional derivative are oftentimes overlooked in treating the topics in which these terms are defined and used. In this paper a good variety of such terms is discussed.

**THE GEOMETRY OF A PLANE CURVE DERIVED FROM ITS HODOGRAPH.** Robert W. Hartley, *Southwestern*. By showing the geometrical relations between a plane curve as generated by a moving point and the hodograph of the motion, this paper shows how some properties of a curve may be obtained from those of its hodograph. In particular, this paper shows how properties of conics may be obtained from those of a circle, which is the hodograph of planetary motion.

REAL FUNCTIONS WHOSE SINGULARITIES FORM A DENSE SET. M. G. Boyce, *Vanderbilt University*. An example of a function differentiable everywhere on an interval except at points of a dense set is treated by elementary methods. Other examples, constructible by the method of condensation of singularities, are discussed briefly.

THE MATHEMATICAL BASIS OF CONTRACT BRIDGE. G. S. Bruton, *University of the South*. The underlying mathematics of the theory of bidding in the game of contract bridge is given. The question as to what percentage of deals should make game is considered on theoretical grounds. The basic assumptions are stated, and the result is compared with actual counts.

BASIC MEANINGS IN SECONDARY MATHEMATICS. F. Lynwood Wren, *George Peabody College for Teachers*. More effective learning will take place in mathematics if the instructional program gives attention to the "know why" as well as to the "know how." The Commission on Post-War Plans of the National Council of Teachers of Mathematics emphasized this fact in one of the theses of its report: "We must give more emphasis and much more careful attention to the development of meanings." Furthermore, this report pointed out that meanings do not just happen nor are they developed once and for all. Intelligent instruction calls for as careful planning in the development of meanings as is exercised in the development of skills and concepts.

SUMS OF POWERS. E. Baylis Shanks, *Vanderbilt University*. A proof is given that the sum of the  $k$ th powers of the first  $n$  integers is a polynomial in  $n$  of degree  $k + 1$  with rational coefficients. These rational coefficients are found by evaluating certain determinants contained in a rectangular matrix.

THE DECISION PROBLEM IN THE FREE MODULAR LATTICE. Edgar Hopper, *University of Tennessee*. Polynomials in the free modular lattice on four generators were studied with a view to finding a list of the unequal polynomials such that any arbitrary polynomial of length five or less is equal to one of them. The order relations between the unequal polynomials were to be determined. The results showed that there were 31 general polynomials of length five or less in the free modular lattice on four generators. Inclusion relations were determined for these general polynomials.

## PSYCHOLOGY SECTION

THE PSYCHOLOGICAL CONCOMITANTS OF TRAUMATIC INJURY. Panel Members: Dr. Howard White, *Kennedy Hospital, Chairman*; Dr. Florence Mahoney, *Chief of Physical Medical Rehabilitation, VA, MTG, Kennedy Hospital*; Dr. Hudson Jost, *Gailor Hospital*; Dr. T. E. Newland, *University of Tennessee*; Dr. E. Ohmer Milton, *University of Tennessee*; Dr. A. D. Mueller, *Clinical Psychologist, VA, MTG, Kennedy Hospital*. Rather typically an initial depression and withdrawal from social communication may be expected to accompany major illnesses and injuries. Later reactions are more varied, reflecting markedly the pre-traumatic personality. In general, we may expect a sharpening of the major weaknesses or strengths that are present. There is a need to distinguish between the behavior limitations imposed by the disease or injury itself and those occurring because of social, economic, and legal pressures. Thus brain injured children frequently do not capitalize fully on their abilities because of parental overprotectiveness. Handicapped adults are often disturbed by the uninhibited curiosity of some and the oversolicitousness of other fellow adults. Industrially, they are less acceptable because they are felt to present extra hazard under employment compensation laws. Rehabilitation may be definitely furthered by an accurate evaluation of abilities and aspirations. Functionally useful mechanical aids serve a definite role, but the central problem tends to be one of motivation, especially when the apparent progress is slow.

THE CONTRIBUTIONS OF EDUCATIONAL PSYCHOLOGY TO THE PROBLEMS OF EDUCATION. Panel Members: John W. Gustad, *Vanderbilt University, Chairman*; Robert Davies, *Peabody College for Teachers*; Susan W. Gray,



*George Peabody College for Teachers*; Julian C. Stanley, *George Peabody College for Teachers*. The general purpose of the panel was to point out some of the important areas in which Educational Psychology can and does contribute to the improvement of teaching in schools at all levels.

Dr. Davis discussed the area of learning. He pointed out the differences between the learning experiments conducted on infra-human organisms in the laboratory and the less well controlled but probably more applicable work done in the classroom situation, with emphasis on the need for both and especially the latter.

Dr. Gray presented several problems associated with the teaching of child and adolescent psychology to prospective teachers. One of the most pressing questions was shown to be due to the fact that in many cases, there is only one "required" course which places severe limitations on the content. It was suggested that such training should give the students some idea of ("normal" behaviour, the concept of maturation, and some principles which might serve as guides in handling children. Finally, the point was made that one major issue which must be determined is whether such courses and such understandings do actually make for better teachers.

Dr. Stanley, discussing the contribution of measurement to education, first presented a case-in-point of the wrong approach to testing in which a supervisor, eager for his school system to be "progressive," launched a full scale program without adequate planning and without the assistance of competent advisers. The results, badly misused, were of dubious value, and the testing movement was in poor favor for years afterward. As a substitute, it was proposed that whenever a testing program is to be inaugurated, first there should be a detailed plan making clear to all concerned exactly what is to be done and why.

The contributions of counseling to education were discussed by Dr. Gustad. Such counseling typically deals with the student at the following points in his college career and in the following ways. First, at entrance, he is assisted through sectioning based on tests to find classes where his background and ability will be adequate for competition. Later, he is dealt with when he comes to the question of choosing a course of study leading to a vocation. Along the way, counseling is available for either personal problems which keep him from using his abilities or for study habit difficulties. One research area of great importance was mentioned: the investigation of the personality correlates of achievement and motivation.

CERTIFICATION AND LICENSING OF PSYCHOLOGISTS. Virginia Kirk, *Vanderbilt School of Medicine*. At present the supply of clinical psychologists is not sufficient to meet demands, and there are many people without such training in positions where they are serving the public to the best of their ability. It was felt that until training programs are further developed, and demands can be met, it is best to proceed rather slowly with plans for certification. It was suggested that the section's emphasis for the current year with respect to this question should be one of becoming acquainted with possibilities for clinical psychologists in the state, and of studying the needs of the state in the various areas customarily served by clinical psychologists. It was decided to make a detailed survey of the situation and to report upon it at the next annual meeting of the section.

#### ZOOLOGY SECTION

GROWTH OF THE GONADS IN THE COMMON FOWL FROM HATCHING DATE TO SEXUAL MATURITY. Clare H. Bennett, *Memphis State College*. Sexual maturity in fowl is an important economic factor to the layman and to the poultryman. Chickens used were pedigreed Single Comb White Leghorns. The study was based on a series of ten age groups of both sexes from hatching date to sexual maturity. Results of the study showed a relation between

gonadal size and sexual maturity in both sexes of fowl. A lack of relation between the size of the gonads and age appeared in the male fowls after approximately four months of age.

THE EFFECT OF DIETARY DEFICIENCIES AND ENDOCRINE ALTERATIONS ON THE APYRASE ACTIVITY OF RAT TISSUES. Samuel R. Tipton, and Frances M. Colvin (by invitation), *University of Tennessee*. In studies involving liver homogenates of Rockland rats maintained on adequate diets, a normal apyrase level was established as 95 units or mgm P liberated per gm. dry weight of tissue per hour. This value is raised significantly by administration of thyroid powder or thyroxin. Neither the normal value nor the rise with thyroid is affected significantly by total B deficiency or thiamin deficiency alone. Riboflavin deficiency seems to increase apyrase activity to a level above which thyroid causes little rise. After adrenalectomy apyrase levels are higher than controls. Administration of lipoadrenal extract causes a marked lowering of the normal value.

THE EFFECTS OF THYROID HORMONE ADMINISTRATION AND DIETARY DEFICIENCY ON THE D-AMINO ACIDOXIDASE ACTIVITY OF RAT LIVER AND KIDNEY. Samuel R. Tipton, A. Kurt Weiss (by invitation), and Frances M. Colvin (by invitation). *University of Tennessee*. Using rats of the Rockland strain and employing the Warburg manometric technique we were able to demonstrate a pronounced decrease in the *d*-amino acid oxidase activity in the liver of riboflavin deficient animals. The administration of thyroid powder or thyroxin increased the enzyme activity in the liver of both normal and hyperthyroid animals. The kidney *d*-amino acid oxidase activity was also decreased, though less sharply, in animals fed riboflavin deficient diets. When thyroid powder or thyroxin was administered, however, we were unable to demonstrate a significant change in the activity of the enzyme.

THE SEX OF SOME LARGE BASS (*MICROPTERUS SALMOIDES SALMOIDES*). Glenn Gentry, *State Department of Conservation*. The sex of 110 largemouth bass, weighing from five to twelve pounds each, was determined by examination of the sex organs. Only four of these fish were males and none of these males weighed over six pounds. The scarcity of males is probably due to the following: (1) The males may not grow as large as the females. The males are smaller in many species of fish. (2) The females are probably endowed with more vitality than the males. (3) The male bass is probably more susceptible to the anglers' hooks after spawning activities, since he not only spends about 25 days guarding the eggs and fry, but does not take food during this time.

DETERMINATION OF VENOUS PRESSURE IN CATS. Albert Krupnick, Truett Pierce, Carroll H. Long, *et al.*, *East Tennessee State College*. Using the direct method of Burch and Sodeman, the authors have determined venous pressures in superficial femoral veins of a series of ten cats. An attempt is made to correlate pressure with age and weight.

THE PLETHODON SHERMANI STEJNEGER COMPLEX. J. C. Nicholls, Jr., Collector, *Murphy, N. C.* A resume of the information in hand on an unusual situation in which one species of salamander of the genus *Plethodon plethodon shermani* Stejneger apparently hybridizes with other large species of the genus *Plethodon*, giving rise to various intermediate fertile progeny. A treatment of the geographical and altitudinal distribution of the parent species and intermediate populations, which focus in North Carolina, and extend into neighboring areas of Georgia and Tennessee. Descriptions of characteristics and measurements of populations of vertical transects, and of geographical dispersion.

NOTES ON DESMOGNATHUS OCOEE NICHOLLS. J. C. Nicholls, Jr., Collector, *Murphy, N. C.* Data presented on habits, habitat, environmental factors, species associations, and plant associations of this species.

PROGRAM OF THE EIGHTH ANNUAL MEETING OF THE  
TENNESSEE JUNIOR ACADEMY OF SCIENCE

1. WELCOME TO THE YOUNG SCIENTISTS OF TENNESSEE. Frances R. Bottum, President, *Tennessee Academy of Science*.
2. CAREERS IN SCIENCE. C. B. Weiss, *Buckeye Cotton Oil Company*, Memphis.
3. THE IMPORTANCE OF REMOVING HYPO FROM PHOTOGRAPHIC PRINTS, Patricia Wintker, *Treadwell High School*, Memphis.
4. INTERESTING AND NOVEL USES OF GLASS. Patricia Reigle, *Treadwell High School*, Memphis.
5. OUR MOST IMPORTANT FARMHAND, THE EARTHWORM. Robert Pace, *West End High School*, Nashville.
6. DEVICES FOR THE BLIND. Harward Stearns, *Central High School*, Memphis.
7. STABILITY IS PERFECTION IN AN AIRPLANE. Eugene Belote, *Catholic High School for Boys*, Memphis.
8. MOUNTING THE SKELETON OF A CAT. Donald Riley, *Grove High School*, Paris.
9. SCIENCE TALENT SEARCH. H. A. Webb, *George Peabody College for Teachers*, Nashville.
10. OPERATION ATOMIC VISION. Dick Perkins, *Catholic High School for Boys*, Memphis.
11. HOW TO KNOW THE BIRDS. Billy Mann, *Grove High School*, Paris.
12. ELECTRICITY IS USED IN THE STUDY OF BIRDS. Ronald Haas, *Central High School*, Memphis.
13. MY STUDY AND OBSERVATIONS OF A PRAYING MANTIS. Bradley Stanford, *Central High School*, Memphis.
14. LIFE HISTORY OF THE CECROPIA MOTH. Loretta Tucker, *Linden High School*, Linden.
15. BANDING BIRDS ON MACHIAS SEAL ISLAND FOR THE UNITED STATES FISH AND WILDLIFE SERVICE. Patricia Moore, *Central High School*, Memphis.
16. REPORT ON THE CHICKASAW RESEARCH FOUNDATION. Harry Estes, *Central High School*, Memphis.
17. THIS VITAL EARTH (FILM). Jerry A. Shannon, *Peabody College Demonstration School*, Nashville.
18. ANNOUNCEMENT OF AWARDS. Judges: Rose Woolridge, *Southside High School*, Memphis; Jesse Fox, *Memphis State College*, Memphis; Brother Ignatus Vincent, *Christian Brothers College*, Memphis.
19. FAREWELL UNTIL NEXT YEAR. Robert W. McGowan, *Memphis State College*, Memphis.

THE ACADEMY DINNER

The Annual Academy Dinner was held on Friday, December 2, in the Parkview Hotel, with Dr. Frances R. Bottum presiding. Dr. Peyton Nalle Rhodes, President of Southwestern at Memphis, gave an address of welcome to the Academy. An informal session followed in which members introduced themselves to the assembly and the President introduced the new officers and Section chairmen of the Academy, whose names follow:

President—Samuel L. Meyer, University of Tennessee

Vice President—M. L. MacQueen, Southwestern College

Secretary—Arlo I. Smith, Southwestern College

Treasurer—James J. Friauf, Vanderbilt University

Editor of the Journal—Jesse M. Shaver, George Peabody College for teachers

Director of the Reelfoot Lake Biological Station—C. L. Baker, Southwestern College

Botany Section—Fred Wolf, Vanderbilt University

Chemistry Section—George Schweitzer, University of Tennessee

Geology-Geography Section—H. B. Burwell, State Geologist, Nashville  
Mathematics Section—Winston Massey, University of Chattanooga  
Psychology Section—Stanford C. Ericksen, Vanderbilt University  
Zoology Section—Samuel R. Tipton, University of Tennessee

The Annual Evening Lecture was delivered by Dr. George R. Mayfield, Professor Emeritus of German at Vanderbilt University. Dr. Mayfield spoke on the subject "Reelfoot Lake, Problem Child of Tennessee" and gave an interesting history of the ownership and management of Reelfoot Lake. His address was published in the April number of JOURNAL.

#### BUSINESS MEETINGS OF THE ACADEMY

The Tennessee Academy of Science met for its annual Business Meeting at 4:00 P. M., Friday, December 2, 1949, with Miss Frances Bottum presiding. The Secretary read the minutes of the transactions of the summer meeting of the Executive Committee, which were approved. The reading of the minutes of the annual meeting was waived since they had been published in the JOURNAL of the Academy.

The following reports were made by officers of the Academy: (1) The *Editor* of the JOURNAL, Dr. Jesse M. Shaver, made an oral report concerning the status of business affairs of the JOURNAL. (2) The Director of the Reelfoot Lake Biological Station, Dr. Clinton L. Baker, announced that his report would be published. (3) The report of the Treasurer, Dr. James J. Friauf, was read and approved.

The Secretary read the list of new members elected by the Executive Committee since the last meeting of the Academy. It was voted unanimously to confirm these memberships.

The following committees were appointed: (1) The nominating committee, appointed prior to the meeting, consisting of Dr. C. S. Shoup, *Chairman*; Dr. C. A. Buehler, and Dr. F. T. Wolf. (2) The Tennessee Science Talent Search Committee, consisting of Dr. Calvin A. Buehler; Dr. Howard Kirksey; Mr. James L. Major, *Chairman*; Dr. C. S. Shoup; Dr. Hanór Webb; and Miss Katherine Matthews. (3) The Committee on Resolutions, Dr. Royal Shanks, *Chairman*; Dr. D. M. Brown; Dr. C. P. Freeman; had been appointed at the beginning of the morning session. (4) The Auditing Committee, consisting of Dr. Wilson Miser and Dr. F. L. Wren.

The following reports of committees were made and accepted: (1) In the absence of Mr. Major, Dr. Webb made the report for the Science Talent Search Committee. (2) Dr. C. L. Baker made a short report on behalf of the Committee on Local Arrangements. (3) Dr. Royal Shanks read the report of the Resolutions Committee.

The amendments to the Constitution proposed by the Executive Committee were presented for ratification by the Academy. Both the existing provisions and the proposed changes were read by the Secretary. These changes would alter Article II, Section 9, con-

cerning dues; Article III, Section 3, concerning the work of the Treasurer; Article IV, Section 4, concerning the representative to the AAAS Council; and Article V, Sections 1 and 3, concerning affiliated societies and the Junior Academy. After an extended discussion of particular features of the proposals, the amendments were unanimously adopted.

The Nominating Committee made the following nominations for officers of the Academy:

*President:* Dr. Samuel L. Meyer, Botany Department, University of Tennessee, Knoxville

*Vice President:* Dr. M. L. MacQueen, Mathematics Department, Southwestern at Memphis

*Secretary:* Mr. W. Roger Rusk, Physics Department, University of Tennessee, Knoxville

*Treasurer:* Dr. James J. Friauf, Biology Department, Vanderbilt University

Mr. Rusk declined the nomination for Secretary, and Dr. Arlo I. Smith of Southwestern was nominated from the floor for this post. By voice vote, upon a motion by Dr. Webb, the Academy then instructed the Secretary to cast the vote for the entire slate of officers.

The business having been transacted, the Fifty-Ninth Meeting of the Tennessee Academy of Science adjourned *sine die*.

## NEWS OF TENNESSEE SCIENCE

(Continued from page 257)

- Foster, J. W., and S. F. Carson. 1950. Citric acid formation by *Aspergillus niger* through condensation of  $3C_2$  moities. *Jour. Amer. Chem. Soc.*, 72: 1865.
- Ganier, A. F. (Nashville, Tenn.). 1949. Nesting notes on the broad-tailed hawk. *The Migrant*, 20 (4): 57-59. Dec. *Buteo p. platypterus* near Nashville.
- Giles, N. H., Jr., and H. P. Riley (ORNL). 1950. Studies on the mechanism of the oxygen effect on the radiosensitivity of *Tradescantia* chromosomes. *Proc. Natl. Acad. Sci.*, 36(6): 337-344. June.
- King, Willis (Tenn. Cons. Comm., Nashville). 1950. Will the stripers come back? *Wildlife in North Carolina*, 13 (10): 18-21. (Refers to striped bass, *Roccus saxatilis*.)
- Kittrell, F. W. (TVA, Knoxville), 1949. Evaluation of the biochemical oxygen demand in streams. *Tappi* (Tech. Assn. Pulp & Paper Indus.), 32 (12): 540-543. Dec.
- Kittrell, F. W., and F. W. Thomas. 1949. Effect of river system development on water quality in the Tennessee Valley. *Jour. Amer. Water Works Assn.*, 41 (9): 777-789. Sept.
- Kruse, C. W., A. D. Hess, and G. F. Ludvik (TVA). 1949. The performance of liquid spray nozzles for aircraft insecticide application. *Jour. Natl. Malaria Soc.*, 8 (4): 312-334. Dec.
- Minot, A. S., and Merwin Grimes (Vanderbilt Univ.). 1949. The urinary excretion of pentose and phosphorus-containing complexes in nutritional muscular dystrophy. *Jour. Nutrition*, 39 (2): 159-165.

(Continued on page 296)